APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,033	12/06/2001	Attila D. Banki	PM 2000.063	8954

7590 04/13/2007	EXAMINER
Gary D. Lawson
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Houston, TX 77252-2189	PROCTOR, JASON SCOTT

	ART UNIT	PAPER NUMBER
	2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<table>
<tr><td rowspan="3">Office Action Summary</td><td>Application No.</td><td>Applicant(s)</td></tr>
<tr><td>10/020,033</td><td>BANKI ET AL.</td></tr>
<tr><td>Examiner</td><td>Art Unit</td><td></td></tr>
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	Examiner	Art Unit	
	Jason Proctor	2123	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>27 January 2007</u>.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-13, 15-28, 30, 31 and 43-46</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-13, 15-28, 30, 31 and 43-46</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>06 December 2001</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>1/26/07</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

DETAILED ACTION

Claims 1-31 were rejected and claims 35-42 were subject to a restriction requirement in the Office Action of 27 July 2006.

Applicants' submission on 26 January 2007 has amended claims 1, 11, 15, 16, 19, and 20; cancelled claims 14, 29, and 35-42; and presented new claims 43-46. Claims 1-13, 15-28, 30-31, and 43-46 are pending in this application.

Claims 1-13, 15-28, 30-31, and 43-46 are rejected.

Restriction Requirement

1.   The previous restriction requirement regarding claims 35-42 is withdrawn in response to the cancellation of claims 35-42.

Information Disclosure Statement

2.   The information disclosure statement (IDS) submitted on 26 January 2007 was filed after the mailing date of the non-final Office Action on 27 July 2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

The information disclosure statement submitted on 27 January 2007 appears to be a duplicate of the 26 January 2007 submission and will therefore be disregarded. If this is in error, clarification is requested.

Rejections under 35 U.S.C. § 112

The previous rejection of claims 11 and 20-31 under 35 U.S.C. § 112, second paragraph,

as being indefinite have been withdrawn in response to the amendment to those claims.

3.   Claim 44 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention.

Claim 44 recites "the mechanical facilities" in line 1. There is insufficient antecedent

basis for this limitation.

Response to Arguments – 35 USC § 103

In response to the previous rejection of claims 1-31 under 35 U.S.C. § 103 as being

unpatentable over Vujosevic in view of Watts, Applicants argue in part that:

> Vujosevic does not provide or suggest that the object-oriented software is configured [to]
> "integrate, without intervention of the simulator user..." As such, the user appears to be involved in the
> integration.

The Examiner has fully considered this argument and has found it persuasive.

Accordingly, the previous rejections under 35 U.S.C. § 103 are withdrawn in response to the

amended claim language requiring "integration, without intervention of the simulator user..."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. § 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. § 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

4.   Claims 1-13, 15-18, 20, 23-28, 30, 43, and 46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over "Real-Time Workshop" by Simulink in view of "The C++ Programming Language" by Bjarne Stroustrup.

Regarding claims 1 and 20, Simulink teaches a processor and a memory coupled to the processor [*"The Real-Time ·Workshop® is a multiplatform product, running on Microsoft Windows 95, Windows 98, Windows NT, and UNIX systems."* (page xvi, first paragraph)];

Software in a main simulation system stored in the memory, the software configured to provide a logic interface to dynamically construct logic to customize simulation of a system through a model of the physical system [*"The Real-Time Workshop, for use with MATLAB and Simulink, produces code directly from Simulink models and automatically builds programs that can be run in a variety of environments, including real-time systems and stand-alone simulations."* (page 1-2, first paragraph)];

Convert the constructed logic into corresponding code during a simulation without intervention of the simulator user [*"...automatically builds programs..."* (page 1-2, first paragraph)];

Integrate, without intervention of the simulator user, the code with the main simulation system [*"Seamless integration with MATLAB and Simulink"* (page 1-3, bulleted list)] which comprises a simulation data model and simulation algorithms [*"...how the generated model code is executed. The Real-Time Workshop generates algorithmic code as defined by your model. You may include your own code into your model via S-functions."* (page 6-4, first paragraph); **"solver and data logging routines"** (page 6-4, Figure 6-1), i.e. solver (algorithms) and data logs (data model) are present in the main simulation system, accessed via the Run-Time Interface];

Wherein the code extends the simulation data model by creating new classes that inherit from the simulation data model, and the code is configured to call functions of the integrated simulation system and use member data of the integrated simulation system [*"An open and extensible architecture"* (page 1-3, bulleted list); *"Because Simulink is customizable, you can further simplify modeling by creating custom blocks and block libraries from continuous and discrete-time components."* (page 1-10, fourth paragraph); *"All Simulink blocks are*

automatically converted to code, with the exception of MATLAB function blocks and S-function

blocks that invoke M-files." (page 1-4, second paragraph); and "solver and data logging routines"

are accessed via the Run-Time Interface (see above)]; and

Execute the integrated simulation system [*"...automatically builds programs that can be*

run in a variety of environments..." (page 1-2, first paragraph)].

Simulink does not expressly teach that the software or the code is object oriented.

Stroustrup teaches object oriented code (page 726, last paragraph).

Simulink and Stroustrup are analogous art because both are drawn to the generation of

code.

It would have been obvious to a person of ordinary skill in the art to combine the

teachings of Stroustrup with Simulink to result in object oriented software that produces object

oriented code as expressly motivated by Stroustrup, because traditional design methods (non-

object oriented) are "less resilient to change, less amenable to tools, less suited for parallel

development, and less suited for concurrent execution." (page 726, last paragraph).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of

Applicants' invention to combine the teachings of Stroustrup and Simulink to arrive at the

invention specified in claim 1.

Regarding claim 2, Simulink teaches that the constructed logic comprises facility

management logic which is representative of steps used to simulate the monitoring and

controlling of mechanical facilities associated with the physical system [*"The first step in the*

design process is to develop a plant model. You can build models involving plant, sensor, and

actuator dynamics using the Simulink collection of linear and nonlinear components." (page 1-10, fourth paragraph); *"Rapid prototyping begins with developing block diagram plant models of sufficient fidelity for preliminary system design and simulation."* (page 1-10, third paragraph)].

Regarding claims 3 and 24, Simulink teaches that the logic interface comprises a logic flow chart interface [*"Stateflow is a graphical design and development tool for complex control and supervisory logic problems. It supports flow diagram notation as well as state transition notation."* (page 1-21, first paragraph)].

Regarding claims 4-6 and 26, Simulink teaches that the logic flow chart interface comprises arrows (page 12-21). Simulink teaches that the logic flow chart interface comprises icons representing basic logic control constructs for looping, decision making, statement execution, and logic entry and exit [*"Stateflow supports flow diagram notation as well as state transition notation..."* (page xix, third paragraph and bulleted list)].

Regarding claim 7, Simulink teaches that the logic interface comprises a text-based logic code interface [*"To display the model with Simulink, at the MATLAB command line, enter: f14"* (page 2-12, last paragraph)].

Regarding claims 8 and 27, Simulink teaches that the text-based logic code interface comprises a graphical text editor for performing one or more of entering, modifying and deleting lines of alpha-numeric text [*"To display the model with Simulink, at the MATLAB command line,*

enter: f14" (page 2-12, last paragraph); *"This is the Simulink model that appears:"* (page 2-13,

Figure 2-1)].

Regarding claims 9 and 13, Simulink teaches that the text-based logic code is a facility

management control language automatically created from a logic flow chart [*"The Real-Time*

Workshop, for use with MATLAB and Simulink, produces code directly from Simulink models

and automatically builds programs that can be run in a variety of environments, including real-

time systems and stand-alone simulations." (page 1-2, first paragraph)].

Regarding claims 10 and 12, Simulink teaches that the facility management control

language is automatically converted into C++ code (page xxiv). The combination formed in the

rejection of claim 1 teaches the generation of object oriented code.

Claim 11 recites "wherein the facility management control language is an object-oriented

language that is parsed prior to conversion into the object-oriented-facility management code to

verify syntax" which is an implicit step in any computer compiler. This step is regarded as

implicit in the system of claim 1 in order to fulfill the requirements of 35 U.S.C. § 112, first

paragraph, as regards enablement. The combination formed in the rejection of claim 1 expressly

discloses a computer compiler (ex. page xxiv) and a person of ordinary skill in the art of

computer software is presumed to be aware that a computer compiler parses code to verify

syntax.

Regarding claim 15, see page 1-12, "UNIX versions of make", and 2-18, "GNU's gcc compiler". Applicants' claim language describes the well-known method employed by GNU's gcc compiler.

Regarding claim 16, see page xxiv, "Microsoft Visual/C++". Applicants' claim language describes the well-known method employed by a Microsoft C++ compiler.

Regarding claims 17, 43, and 46, see page 1-19, last paragraph, "MdlOutputs must be called at every time step by the run-time interface."

Regarding claim 18, see page xvi, "Microsoft Windows 95". Applicants' claim language describes the well-known method of executing software employed by Windows 95.

Regarding claim 23, Simulink teaches that construction of the logic comprises using a graphical user interface to perform at least selecting and using an existing logic [*"To display the model with Simulink, at the MATLAB command line, enter:* f14" (page 2-12, last paragraph); *"This is the Simulink model that appears:"* (page 2-13, Figure 2-1)].

Regarding claim 25, see page 1-4, second paragraph.

Regarding claim 28, see page xxiv.

Regarding claim 30, see page 1-10.

Claims 19 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over

"Real-Time Workshop" by Simulink in view of "The C++ Programming Language" by Bjarne

Stroustrup as applied to claims 1 and 20, and further in view of Official Notice.

Regarding claims 19 and 31, Official Notice has previously been taken regarding the use

of a plurality of connected processors to perform a simulation.

5.   Claims 21-22 and 44-45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over

"Real-Time Workshop" by Simulink in view of "The C++ Programming Language" by Bjarne

Stroustrup as applied to claims 1, 20, and 43, and further in view of US Patent No. 6,052,520 to

Watts.

Regarding claims 21-22, and 44-45, Simulink in view of Stroustrup does not expressly

teach that the physical system comprises a hydrocarbon bearing subterranean formation or that

the physical system comprises fluid-containing facilities associated with production of

hydrocarbons from the hydrocarbon-bearing subterranean formation.

Watts discloses this intended use for the system of Simulink in view of Stroustrup

(abstract, entire reference).

It would have been obvious to a person of ordinary skill in the art at the time of

Applicants' invention to combine the teachings of Watts with Simulink in view of Stroustrup as

expressly motivated by Watts, in order to understand the complex chemical, physical, and fluid

flow processes occurring in a petroleum reservoir sufficiently well to be able to predict future

behavior of a reservoir and to maximize recovery of hydrocarbons (column 1, lines 16-34).

Therefore it would have been obvious to a person of ordinary skill in the art at the time of

Applicants' invention to combine the teachings of Watts with Simulink in view of Stroustrup to

arrive at the invention specified by claims 21-22 and 44-45.

Conclusion

Art considered pertinent by the examiner but not applied has been cited on form PTO-

892.

"Simulink Dynamic System Simulation for MATLAB" by The Math Works, Inc.

discloses features implicit in the references to "Simulink" and "MATLAB" made by the "Real-

Time Workshop" reference applied under 35 U.S.C. § 103.

Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this
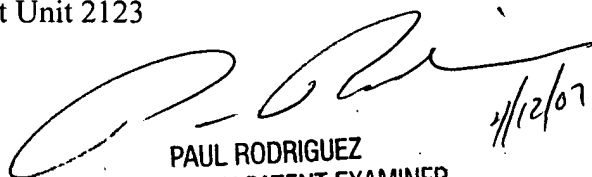
final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason Proctor whose telephone number is (571) 272-3713. The

examiner can normally be reached on 8:30 am-4:30 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Paul Rodriguez can be reached at (571) 272-3753. The fax phone number for the

organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application should be

directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of

an application may be obtained from the Patent Application Information Retrieval (PAIR)

system. Status information for published applications may be obtained from either Private PAIR

or Public PAIR. Status information for unpublished applications is available through Private

PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Jason Proctor
Examiner
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